IN THE CLAIMS

The following listing of claims will replace all prior versions and listings of claims in the Application:

LISTING OF CLAIMS:

1. (Original) In a network device in a network, a method of establishing a communications path through the network device for a stream of data, the method comprising the steps of:

receiving a first data distribution message from an upstream device in the network;

acknowledging receipt of the first data distribution message to the upstream device in the network;

forwarding a second data distribution message to a downstream device in the network; and

determining if the network device receives an acknowledgment of receipt of the second data distribution message, and if the network device receives an acknowledgment, establishing at least one path through the network device for a stream of data identified by the first data distribution message between the upstream device and a downstream device identified in the acknowledgment.

2. (Original) The method of claim 1 wherein the step of receiving a first data distribution message from an upstream device in the network comprises the steps of:

obtaining, from the first data distribution message, a stream identifier that identifies the stream of data for which the communications path is to be established through the network device;

storing the stream identifier in a path table, the path table used by a data distribution process in the network device to identify paths for the stream of data through the network device; and

configuring an upstream device identifier in the second data distribution message with an identity of the network device that received the first data distribution message.

3. (Original) The method of claim 2 wherein the step of establishing at least one path through the network device between the upstream device and the downstream device comprises the steps of:

obtaining a downstream device identifier from within the acknowledgment, the downstream device identifier identifying a downstream network device that supports the data distribution protocol and that originated the acknowledgment;

obtaining a stream identifier from within the acknowledgment, the stream identifier identifying a stream of data to which the acknowledgment is associated; and

creating a path entry in the path table for a stream of data identified by the stream identifier in the acknowledgment received by the network device by associating the downstream device identifier to the stream identifier in the path table to create a path for the stream of data to each downstream device associated with the stream identifier.

4. (Original) The method of claim 3 wherein the stream identifier includes at least one of:

i) a data indicator for the stream of data; and

ii) an identification of the server computer system providing the stream of data.

5. (Original) The method of claim 3 wherein the step of creating a path entry in the path table for the stream of data identified by the stream identifier further comprises the step of:

> incrementing a host device counter associated with the path entry in the path table for the stream of data in order to track how many host devices use a path defined by the path entry in the network device to receive the stream of data.

6. (Currently Amended) The method of claim 1 wherein if, in the step determining if the network device receives an acknowledgment ~~on the communications interface~~ of receipt of the second data distribution message, the network device determines that it did not receive the acknowledgment, the method performs the operations of:

> establishing at least one host path through the network device for the stream of data, the at least one host path indicating that a host device coupled to the network device is to receive the stream of data; and

> receiving a payload distribution message containing the stream of data, the payload distribution message being associated with a stream identifier in the path table;

> removing payload data from the payload distribution message; and

> forwarding the payload data to the host device as the stream of data.

7. (Original) The method of claim 1 further including the steps of:

> receiving a payload distribution message from an upstream device in the network, the payload distribution message containing a stream identifier associated with the at least one path through the network device;

> consulting a path table containing the at least one path through the network device to determine each path on which to forward the payload distribution message; and

forwarding the payload distribution message on each path determined from the step of consulting the path table such that downstream network devices can receive the payload distribution message.

8. (Original) The method of claim 1 wherein:

the acknowledgment includes a downstream device identifier identifying the network device as a downstream device with respect to the upstream device that originated the first data distribution message and to which the acknowledgement is forwarded;

the acknowledgment includes a stream identifier identifying a stream of data to which the acknowledgment is associated; and

wherein the acknowledgement is received the by the upstream device that originated the second data distribution message and is treated as a downstream acknowledgement forwarded from the downstream network device.

9. (Original) The method of claim 1 wherein the downstream device is a network device and wherein the step of forwarding forwards the entire first data distribution message to the downstream device such that the downstream device can establish a communications path through the network for the stream of data.

10. (Original) The method of claim 1 wherein:

the downstream device is a host device that requested receipt of the stream of data; and

wherein the step of forwarding comprises the step of:

forwarding a payload portion of the stream of data in the first data distribution message to the host device such that the host device can receive the stream of data over the communications path through the network.

11. (Original) The method of claim 1 wherein:

      the first data distribution message contains a destination network address identifying a host device which provided a request to a server device for the stream of data served from the server device; and

      wherein the step of forwarding forwards the second data distribution message to a downstream device using a routing protocol that selects a route that forwards the second data distribution message towards a host device which provided the request to the server device for the stream of data.

12. (Original) The method of claim 11 wherein if the routing protocol determines that there are multiple routes that can be used to forward the second data distribution message towards a host device which provided the request to the server device for the stream of data, the routing protocol selects a route to a downstream network device that contains an established path for the stream of data identified by a stream identifier within the first data distribution message.

13. (Original) The method of claim 1 further including the steps of:

      receiving a portion of data associated with the stream of data, the portion of data originating from a server device that serves the stream of data and including a data distribution header containing a stream identifier for this portion of data; and

      forwarding the portion of data to a downstream device associated with each of the at least one path for the stream of data as identified in a path table associated with the stream identifier, such that the portion of data is distributed on each of the at least one path in the path table towards host devices that requested to receive the stream of data.

14. (Original) A method of propagating payload data through a network device in a network, the method comprising the steps of:

receiving a payload distribution message containing a data distribution header which includes a stream identifier identifying a stream of data;

based on the stream identifier, consulting a path table to determine each path on which to forward at least a portion of the payload distribution message to a downstream device in the network; and

forwarding, for each path in the path table, at least a portion of the payload distribution message to a downstream device in the network such that the downstream device receives payload data within the payload distribution message.

15. (Original) The method of claim 14 wherein at least one downstream device in the network is a host device and wherein the step of forwarding, for each path in the path table, at least a portion of the payload distribution message to a downstream device in the network includes the steps of:

extracting, for each host path in the path table, payload data from the payload distribution message; and

forwarding the payload data to the host device such that the host device receives the payload data received by the network device within the payload distribution message.

16. (Original) The method of claim 15 wherein the payload data is stream data and wherein the step of extracting, for each host path in the path table, further includes the step of:

extracting header information for the stream data from the payload distribution message; and

creating a packet for receipt by the host device, the packet including the header information for the stream data and including the stream data extracted from the payload distribution message; and

wherein the step of forwarding the payload data to the host device comprises forwarding the packet for receipt by the host device such that the host device receives a packet of stream data.

17. (Original) A network device comprising:

an communications interface;

a memory system;

a processor; and

an interconnection mechanism coupling the communications interface, the memory system, and the processor;

wherein the memory system is configured with a data distribution application, that when performed on the processor, provides a data distribution process that establishes a communications path through the network device in a network for a stream of data by performing the operations of:

receiving, via the communications interface, a first data distribution message from an upstream device in the network;

acknowledging receipt of the first data distribution message to the upstream device in the network;

forwarding, via the communications interface, a second data distribution message to a downstream device in the network; and

determining if the network device receives an acknowledgment of receipt of the second data distribution message, and if the network device receives an acknowledgment, establishing, in the memory system, at least one path through the network device for a stream of data identified by the first data distribution message between the upstream device and a downstream device identified in the acknowledgment.

18. (Original) The network device of claim 17 wherein when the data distribution process performs the operation of receiving a first data distribution message from an upstream device in the network, the data distribution process performs the operations of:

obtaining, from the first data distribution message in the memory system, a stream identifier that identifies the stream of data for which the communications path is to be established through the network device;

storing the stream identifier in a path table in the memory system, the path table used by a data distribution process in the network device to identify paths for the stream of data through the network device; and

configuring an upstream device identifier in the second data distribution message in the memory system with an identity of the network device that received the first data distribution message.

19. (Original) The network device of claim 18 wherein when the data distribution process performs the operation of establishing at least one path through the network device between the upstream device and the downstream device, the data distribution process performs the operations of:

obtaining a downstream device identifier from within the acknowledgment in the memory system, the downstream device identifier identifying a downstream network device that supports the data distribution protocol and that originated the acknowledgment;

obtaining a stream identifier from within the acknowledgment in the memory system, the stream identifier identifying a stream of data to which the acknowledgment is associated; and

creating a path entry in the path table for a stream of data identified by the stream identifier in the acknowledgment received by the network device by associating the downstream device identifier to the stream identifier in the path table to create a path for the stream of data to each downstream device associated with the stream identifier.

20. (Original) The network device of claim 19 wherein the stream identifier
includes at least one of:

     i) a data indicator for the stream of data; and

     ii) an identification of the server computer system providing the stream of
data.

21. (Original) The network device of claim 19 wherein when the data distribution
process performs the operation of creating a path entry in the path table for the
stream of data identified by the stream identifier, the data distribution process
performs the operation of:

     incrementing a host device counter associated with the path entry in the
path table for the stream of data in order to track how many host devices use a
path defined by the path entry in the network device to receive the stream of
data.

22. (Original) The network device of claim 17 wherein when the data distribution
process performs the operation of determining if the network device receives an
acknowledgment on the communications interface of receipt of the second data
distribution message, if the network device does not receive the
acknowledgment, the data distribution process performs the operations of:

     establishing, in a path table in the memory system, at least one host path
through the network device for the stream of data, the at least one host path
indicating that a host device coupled to the network device is to receive the
stream of data; and

     receiving, via the communications interface, a payload distribution
message containing the stream of data, the payload distribution message being
associated with a stream identifier in the path table;

     removing payload data from the payload distribution message; and

     forwarding the payload data to the host device as the stream of data.

23. (Original) The network device of claim 17 wherein the data distribution process further performs the operation of:

receiving, via the communications interface, a payload distribution message from an upstream device in the network, the payload distribution message containing a stream identifier associated with the at least one path through the network device;

consulting a path table in the memory system containing the at least one path through the network device to determine each path on which to forward the payload distribution message; and

forwarding the payload distribution message on each path determined from the step of consulting the path table such that downstream network devices can receive the payload distribution message.

24. (Original) The network device of claim 17 wherein the downstream device is a network device and wherein when the data distribution process performs the operation of forwarding, the data distribution process forwards the entire first data distribution message to the downstream device such that the downstream device can establish a communications path through the network for the stream of data.

25. (Original) The network device of claim 17 wherein:

the downstream device is a host device that requested receipt of the stream of data; and

wherein when the data distribution process performs the operation of forwarding, the data distribution process performs the operation of:

forwarding a payload portion of the stream of data in the first data distribution message to the host device such that the host device can receive the stream of data over the communications path through the network.

26. (Original) The network device of claim 17 wherein:

the first data distribution message contains a destination network address identifying a host device which provided a request to a server device for the stream of data served from the server device; and

wherein when the data distribution process performs the operation of forwarding, the network device forwards the at least a portion of the second data distribution message to a downstream device using a routing protocol that selects a route that forwards the second data distribution message towards a host device which provided the request to the server device for the stream of data.

27. (Original) The network device of claim 26 wherein if network device operating the routing protocol determines that there are multiple routes that can be used to forward the second data distribution message towards a host device which provided the request to the server device for the stream of data, the network device operates the routing protocol to select a route to a downstream network device that contains an established path for the stream of data identified by a stream identifier within the first data distribution message.

28. (Original) The network device of claim 17 wherein the data distribution process further performs the operations:

receiving a portion of data associated with the stream of data, the portion of data originating from a server device that serves the stream of data and including a data distribution header containing a stream identifier for this portion of data; and

forwarding the portion of data to a downstream device associated with each of the at least one path for the stream of data as identified in a path table associated with the stream identifier, such that the portion of data is distributed on each of the at least one path in the path table towards host devices that requested to receive the stream of data.

29. (Original) A computer program product having a computer-readable medium including data distribution application computer program logic encoded thereon for establishing a communications path through the network device in a network for a stream of data, such that the computer program logic, when performed on at least one processor within a communications device, causes the at least one processor to perform the operations of:

receiving a first data distribution message from an upstream device in the network;

acknowledging receipt of the first data distribution message to the upstream device in the network;

forwarding a second data distribution message to a downstream device in the network; and

determining if the network device receives an acknowledgment of receipt of the second data distribution message, and if the network device receives an acknowledgment, establishing at least one path through the network device for a stream of data identified by the first data distribution message between the upstream device and a downstream device identified in the acknowledgment.

30. (Original) A network device comprising:

an communications interface;

a memory system;

a processor; and

an interconnection mechanism coupling the communications interface, the memory system, and the processor;

wherein the memory system is configured with a data distribution application, that when performed on the processor, provides a means for establishing a communications path through the network device in a network for a stream of data, the means including:

means for receiving a first data distribution message from an upstream device in the network;

means for acknowledging receipt of the first data distribution message to the upstream device in the network;

means for forwarding a second data distribution message to a downstream device in the network; and

means for determining if the network device receives an acknowledgment of receipt of the second data distribution message, and if the network device receives an acknowledgment, establishing at least one path through the network device for a stream of data identified by the first data distribution message between the upstream device and a downstream device identified in the acknowledgment.

31. Canceled

~~23~~ 32. (Currently Amended) The network device of claim 17 wherein:

the acknowledgment includes a downstream device identifier identifying the network device as a downstream device with respect to the upstream device that originated the first data distribution message and to which the acknowledgement is forwarded;

the acknowledgment includes a stream identifier identifying a stream of data to which the acknowledgment is associated; and

wherein the acknowledgement is received the by the upstream device that originated the data distribution message and is treated as an acknowledgement forwarded from the network device.

~~(downstream device = network device)~~

33. (New) The method of claim 1 wherein establishing at least one path through the network device for a stream of data identified by the first data distribution message comprises establishing at least one path through the network device for a stream of data identified by the first data distribution message, the stream

selected from the group consisting of a real time audio stream of data, a real time video stream of data, a real time multimedia stream of data, a non-real time stream of audio data, a non-real time stream of video data, or a non-real time stream of multimedia data.

34. (New) The network device of claim 17 wherein, when establishing, in the memory system, at least one path through the network device for the stream of data comprises establishing at least one path through the network device for a stream of data identified by the first data distribution message, the stream selected from the group consisting of a real time audio stream of data, a real time video stream of data, a real time multimedia stream of data, a non-real time stream of audio data, a non-real time stream of video data, or a non-real time stream of multimedia data.

35. (New) The method of claim 1 wherein the step of determining comprises determining if the network device receives an acknowledgment of receipt of the second data distribution message, and if the network device receives an acknowledgment, establishing at least one path through the network device for a stream of data identified by the first data distribution message between the upstream device and a downstream device identified in the acknowledgment, the stream of data transmitted between the upstream device and a downstream device via a multicast protocol and the network device not multicast enabled.

36. (New) The network device of claim 17 wherein the memory system is configured, when determining, to determine if the network device receives an acknowledgment of receipt of the second data distribution message, and if the network device receives an acknowledgment, establishing, in the memory system, at least one path through the network device for a stream of data identified by the first data distribution message between the upstream device and a downstream device identified in the acknowledgment, the stream of data

transmitted between the upstream device and a downstream device via a multicast protocol and the network device not multicast enabled.